RAVEN CHAPTER 12 GUIDED NOTES: SEXUAL REPRODUCTION & MEIOSIS

1. Define the following terms.
   a. gametes ______________________________________________________
   b. somatic cells __________________________________________________
   c. zygote _________________________________________________________
   d. fertilization ___________________________________________________
   e. diploid _______________________________________________________
   f. haploid _______________________________________________________

2. Why is meiosis called “reduction division”? Why is this process necessary for sexual reproduction?
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   ________________________________________________________________
   ________________________________________________________________

3. Label the diagram of the human lifecycle. Include the chromosome numbers at each stage.
4. Explain synapsis.

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5. Use the diagrams below to distinguish mitosis from meiosis. For an organism where \(2n=4\), draw a cell at **metaphase of mitosis** and a cell at **metaphase 1 of meiosis**.

![Metaphase of mitosis and Metaphase 1 of meiosis](image)

6. Meiosis is said to be a double division. Explain.

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7. Draw a pair of homologous chromosomes in synapsis and then illustrate a crossing over event and the products of crossing over. Label the chiasmata.

8. At what stage of meiosis does crossing over occur? ________________________________
9. Compare the products of mitosis with meiosis.
   a. Mitosis
      ____________________________________________________________
      ____________________________________________________________
   b. Meiosis
      ____________________________________________________________

10. Summarize the significant differences between mitosis and meiosis.

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11. Meiosis is an important source of variation. Define and describe how each of the following contributes to variation within a species.
   a. independent assortment
      ____________________________________________________________
      ____________________________________________________________
   b. crossing over
      ____________________________________________________________
      ____________________________________________________________
   c. random fertilization
      ____________________________________________________________
      ____________________________________________________________

12. What is the significance of genetic variation to natural selection and evolution?
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